

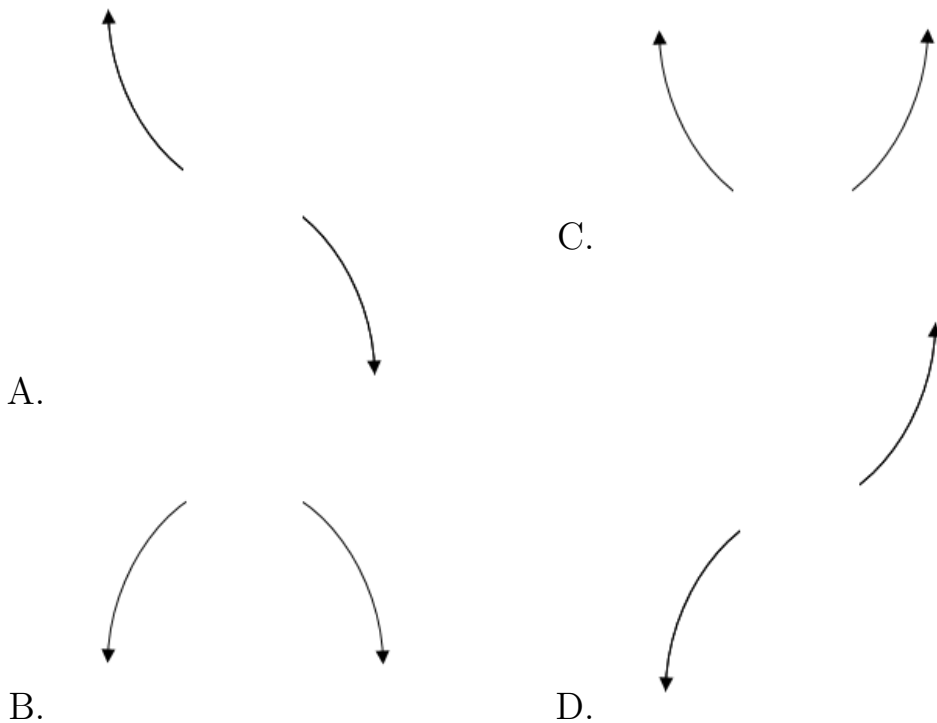
1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form  $ax^3 + bx^2 + cx + d$ .

$$\frac{-7}{4}, -1, \text{ and } -3$$

- A.  $a \in [2, 5], b \in [21, 29], c \in [37, 41], \text{ and } d \in [-23, -18]$   
 B.  $a \in [2, 5], b \in [21, 29], c \in [37, 41], \text{ and } d \in [20, 22]$   
 C.  $a \in [2, 5], b \in [-24, -16], c \in [37, 41], \text{ and } d \in [-23, -18]$   
 D.  $a \in [2, 5], b \in [6, 12], c \in [-19, -11], \text{ and } d \in [-23, -18]$   
 E.  $a \in [2, 5], b \in [0, 3], c \in [-33, -25], \text{ and } d \in [20, 22]$

2. Describe the end behavior of the polynomial below.

$$f(x) = 5(x + 4)^2(x - 4)^3(x + 8)^5(x - 8)^6$$



- E. None of the above.

3. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form  $x^3 + bx^2 + cx + d$ .

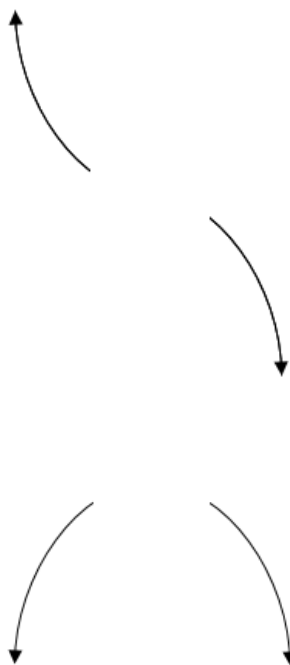
$$4 - 5i \text{ and } 4$$

- A.  $b \in [-13, -11], c \in [71, 74]$ , and  $d \in [-171, -156]$   
 B.  $b \in [9, 15], c \in [71, 74]$ , and  $d \in [156, 167]$   
 C.  $b \in [-6, 2], c \in [-11, -2]$ , and  $d \in [16, 20]$   
 D.  $b \in [-6, 2], c \in [-1, 11]$ , and  $d \in [-28, -19]$   
 E. None of the above.

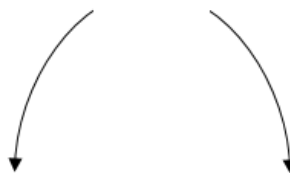
4. Describe the end behavior of the polynomial below.

$$f(x) = -2(x + 7)^3(x - 7)^4(x - 8)^3(x + 8)^5$$

A.



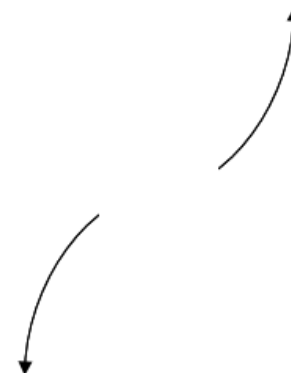
B.



C.

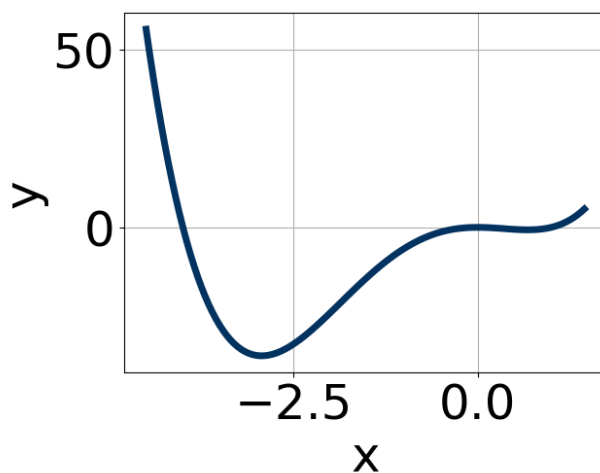


D.



E. None of the above.

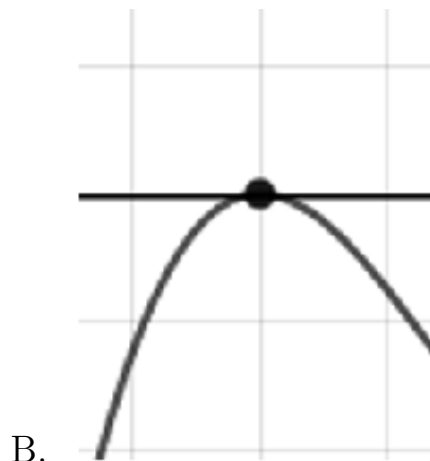
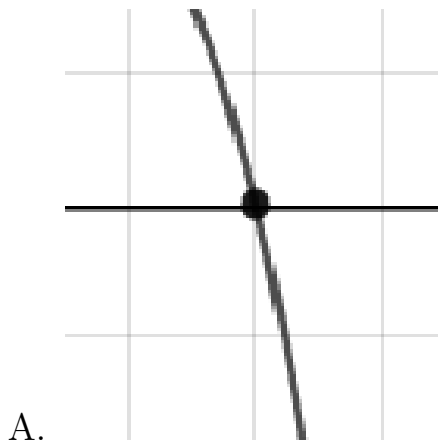
5. Which of the following equations *could* be of the graph presented below?



- A.  $-7x^{10}(x-1)^9(x+4)^8$
- B.  $16x^{10}(x-1)^5(x+4)^9$
- C.  $-12x^8(x-1)^9(x+4)^9$
- D.  $13x^{10}(x-1)^8(x+4)^{11}$
- E.  $4x^5(x-1)^6(x+4)^9$

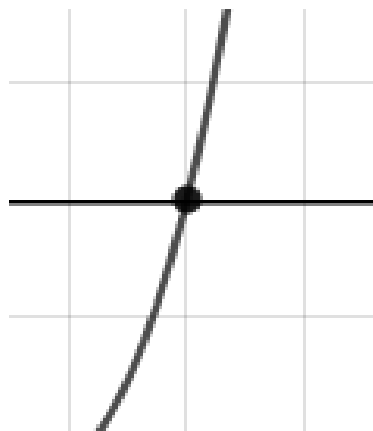
6. Describe the zero behavior of the zero  $x = -7$  of the polynomial below.

$$f(x) = -5(x-2)^6(x+2)^4(x+7)^6(x-7)^5$$





C.



D.

E. None of the above.

7. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form  $x^3 + bx^2 + cx + d$ .

$$-3 + 2i \text{ and } -4$$

- A.  $b \in [10, 19]$ ,  $c \in [32, 39]$ , and  $d \in [51, 63]$   
 B.  $b \in [-1, 3]$ ,  $c \in [4, 8]$ , and  $d \in [11, 17]$   
 C.  $b \in [-1, 3]$ ,  $c \in [-4, 3]$ , and  $d \in [-12, -5]$   
 D.  $b \in [-11, -7]$ ,  $c \in [32, 39]$ , and  $d \in [-52, -50]$   
 E. None of the above.

8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form  $ax^3 + bx^2 + cx + d$ .

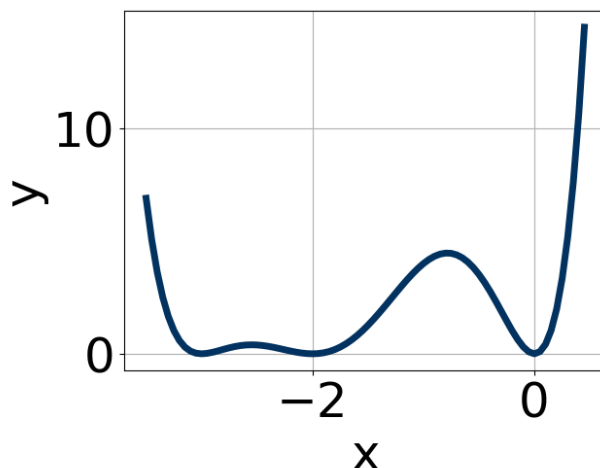
$$\frac{7}{5}, \frac{-5}{2}, \text{ and } \frac{1}{2}$$

- A.  $a \in [18, 21]$ ,  $b \in [65, 73]$ ,  $c \in [23, 32]$ , and  $d \in [-35, -33]$   
 B.  $a \in [18, 21]$ ,  $b \in [8, 17]$ ,  $c \in [-95, -77]$ , and  $d \in [33, 37]$   
 C.  $a \in [18, 21]$ ,  $b \in [8, 17]$ ,  $c \in [-95, -77]$ , and  $d \in [-35, -33]$

D.  $a \in [18, 21], b \in [-33, -27], c \in [-68, -57],$  and  $d \in [33, 37]$

E.  $a \in [18, 21], b \in [-18, -3], c \in [-95, -77],$  and  $d \in [-35, -33]$

9. Which of the following equations *could* be of the graph presented below?



A.  $14x^{11}(x+3)^6(x+2)^7$

B.  $16x^{10}(x+3)^4(x+2)^{11}$

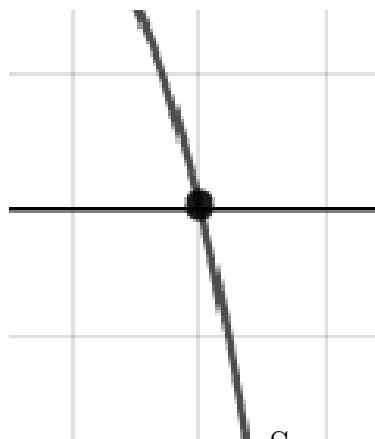
C.  $-4x^8(x+3)^8(x+2)^4$

D.  $8x^6(x+3)^{10}(x+2)^{10}$

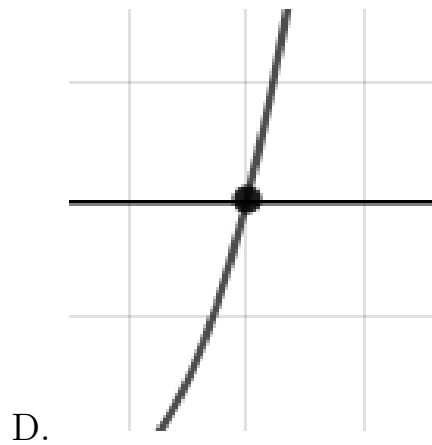
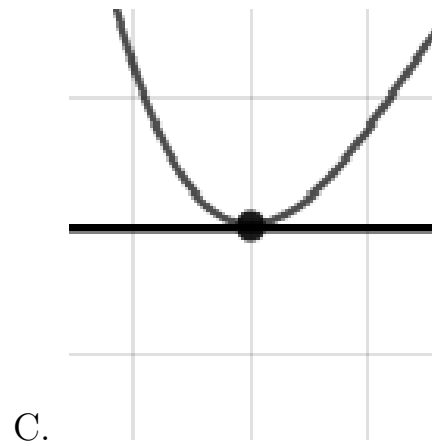
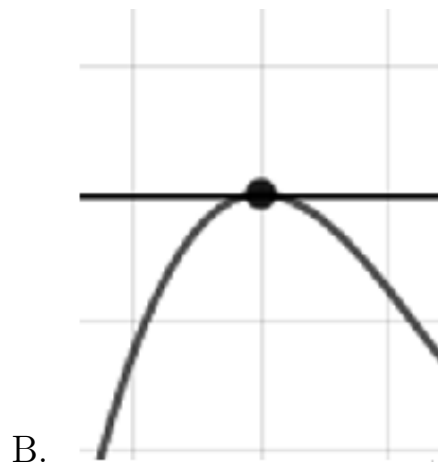
E.  $-5x^8(x+3)^6(x+2)^7$

10. Describe the zero behavior of the zero  $x = 9$  of the polynomial below.

$$f(x) = -3(x+9)^6(x-9)^{11}(x-5)^8(x+5)^9$$



A.



E. None of the above.